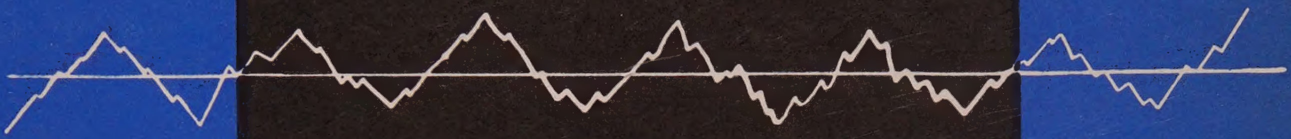
cycles



April 1957

FOUNDATION FOR THE STUDY OF CYCLES
New York, New York

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VOLUME VIII NUMBER 4 APRIL 1957

THE DIRECTOR'S LETTER

Dear Member:

My trip to the southwest is over. I am now back at East Brady, Pa., trying to catch up on lost time.

We had meetings in San Francisco, Santa Barbara, Los Angeles, San Diego, Phoenix, Dallas, San Antonio, Houston, and Tulsa. In addition I phoned all the members I could reach in the towns I passed through from St. Louis west and back again.

I had a fine time and I learned a lot.

I am hoping for another trip to include Chicago, St. Louis, and Kansas City.

General Business

On the trip I was frequently asked, "Do you think we are going into a depression?"

I would not be surprised if we had a set-back in business, but I would be very much surprised if we had a *major* depression at the present time.

The Modified Geisinger Indicator

The Modified Geisinger Indicator continues to suggest caution. For details see page 109 and pages 114 and 115.

Our new members may not know that for an extra $3 they can receive a special advance Geisinger Indicator service.

This service is sent out by first class mail (air mail for the Far West) within a couple of days of the time it is prepared. This special service gives you the Forecast about a month before you get it in *Cycles*.

Stock Prices

Another question I was often asked was, "What are stock prices going to do?"

There will doubtless be many little ups and downs, but the broad picture, for the market as a whole, as best I can see it from a study of cycles, is downward.

War

"How about war?" is another question asked by many.

The number of international battles throughout the world will increase during the next several years, if the cycles of the past continue. This does not *necessarily* mean our involvement, nor does it *necessarily* mean World War III. And of course even World War III does not *necessarily* mean nuclear bombing of civilians, One thing however is certain: dangerous times are ahead.

Inflation

"Will we have further inflation?" is the concern of others.

A knowledge of cycles tells us nothing about the probabilities of inflation. However, a knowledge of politicians gives us the answer. It is "Yes."

Professors

I was much gratified by the interest in cycles by the professors in the colleges I was able to visit on the trip. They knew of course about cycles in their own fields, but they knew little about cycles in other fields. How would they? They have a hard enough job to keep up with developments in their own departments of knowledge.

This fact brings to mind that the

Foundation for the Study of Cycles was created to act as clearing house among scientists concerned with cycles. I have not had time to do as much in this direction as I would like. Perhaps an improved *Journal of Cycle Research* is the answer.

The Journal of Cycle Research

My ideal for the *Journal* (a quarterly magazine which we publish and sell for $4 a year) is as follows:

It should contain articles about cycles in all fields of natural and social science. Each article should include all data, charts, and worksheets used in the analysis. Each article should give the wave length, wave strength, and timing of each cycle found. And each article should be so clearly written that any competent cycle analyst can not only reproduce the work and get the same results, but can follow the analysis and agree with it—or disagree with it—step by step.

All of this will take a lot of work and a lot of education, for scientists as a rule don't know too much about cycle analysis. However, it will have to be done if we are to build a science of cycles.

Philanthropic Foundations

On the trip I was often asked, "Why don't you get money from one of the big foundations?"

There are several reasons. First, most of the foundations are concerned with immediate welfare as distinct from scientific research. You have to have a big heart to set up a foundation. Big hearted people are concerned with relieving misery and suffering. Their emotions govern. They don't realize that *in the long run* scientific research will do more good.

The big hearted attitude is particularly true of the smaller foundations. These, in the aggregate, account for about 45% of the total expenditures. These smaller foundations spend only about 5% for scientific research, and almost all of this amount is for medical research.

Even with the 77 big foundations, who expend 55% of the total, only about 16% of disbursements go for scientific research, and only about a quarter of this, or 4%, for the biological and physical sciences.

Thus only about 4% of 55% or about 2% of the total foundation money is available for the kind of research with which we are concerned..

Second, as a matter of policy, most of the foundations that do have money of this sort to spend, prefer to spend it through colleges and universities. Almost 50% of their money is spent this way. That means that only half of the 2% or 1% of the available money is free to consider requests from people like ourselves.

Third, most foundations, have picked fields for themselves, and do not welcome appeals from outside of their chosen fields.

Fourth, we suffer from the disadvantage that cycle research does not fit into any one category. Suppose that a foundation has three divisions—medical, natural science, social science, with a Director in charge of each. Where do we fit in, covering as we do all three? How can we be taken under the wing of any one Director without his having to step on the toes of the other Directors?

Fifth, I'm just too darn busy getting out the monthly reports and attending to routine administrative matters to give the time to the kind of a campaign that is needed to surmount all the difficulties and come home with the bacon.

Does this explain to you why we don't have money from one of the big foundations? It does to me!

Staff

I am often asked about my staff. In Pennsylvania it consists of two people. My secretary, Lorraine Sherwin, who handles correspondence and varitypes and pastes up *Cycles* and the *Journal of Cycle Research* all ready for our offset printer to photograph; and our statistician, Gertrude Shirk, who does all the research and draws the charts.

The membership plan is handled from the New York office by Gertrude E. Roessle and four part-time girls who assist her.

Happy cycling until next month!

Edward R. Dewey

Director

Research

THE 5.91- OR 5.92-YEAR CYCLE IN STOCK PRICES

Summary

Audit of the so-called 6-year cycle shows its length to be 5.91 years in rails, 5.92 years in the combined index. Its strength in rails at time of crest is 8.65% above trend; in the combined index its strength at time of crest is 6.4% above trend. The next crest in both series is due in September 1958. The force of this cycle is upward from now until then and should serve to minimize declines that may come about from other causes.

IN our January report I told you that the so-called 6-year cycle in stock prices turns out to be a bit shorter than 6 years. As best I can measure it, it is 5.91 years long in the combined stock price index 1871—1956. It is 5.92 years long in the rail stock price index 1831--1956. Perhaps a good guess would be that the true length of the cycle is half way between, 5.915 years.

In my stock market work of 1944 I called this cycle 6.07 years. It did in fact look like 6.07 years at the time. However, with 13 more years of figures the true length seems to be somewhat shorter. There is some reason to think that there is another cycle about 6¼ years long - not as yet isolated - which combined with the 5.915-year cycle to make it look for a time like a 6.07 cycle. I'll investigate this possibility as soon as I can get the time.

There is no need at this point to go over the reasons for thinking that the 5.91-year cycle is a real cycle and not just one caused by accident. These reasons, and examples of the 5.91-year cycle in other things, was covered fully in our January report.

The cycle student is interested in the 5.91- or 5.92-year cycle *as such*, because it is an important building block in the science of cycles. The student of price behavior is interested in it, however, because of the light it will throw on possible future price movements.

The 5.92-year cycle in annual rail stock prices, 1831—1952 has a strength of 108.65% of trend at time of crest, 92.05% of trend at time of trough. That is, it has a typical movement relative to trend of about 18% rise from trough to crest; about 15¼% fall from crest to trough. As the rise or fall covers a period of about 3 years, this means that this cycle in rail stock prices accounts for upward move of about 6% a year during its rising phase, downward strength of about 5% a year during its falling phase.

In the combined annual stock price index the 5.91-year cycle is not quite so strong. For the period 1871—1956 it has a strength of 106.4% of trend at time of crest, 94.0% of trend at time of trough. This means a typical movement of about 13% rise from trough to crest; 11½% fall from crest to trough.

Using monthly figures, the gains should be about a third bigger. Even so, this cycle by itself is not important enough to trade on. However, it is of very definite importance for those who wish to understand market behavior. It needs to be taken into account *in connection with* other cycles and all else you know.

Some individual stocks doubtless show this cycle much more importantly than the averages. It would be worth looking for in the stocks and commodities in which you are interested.

And now for dates: In both rails and combined the 5.92-year cycle is now going

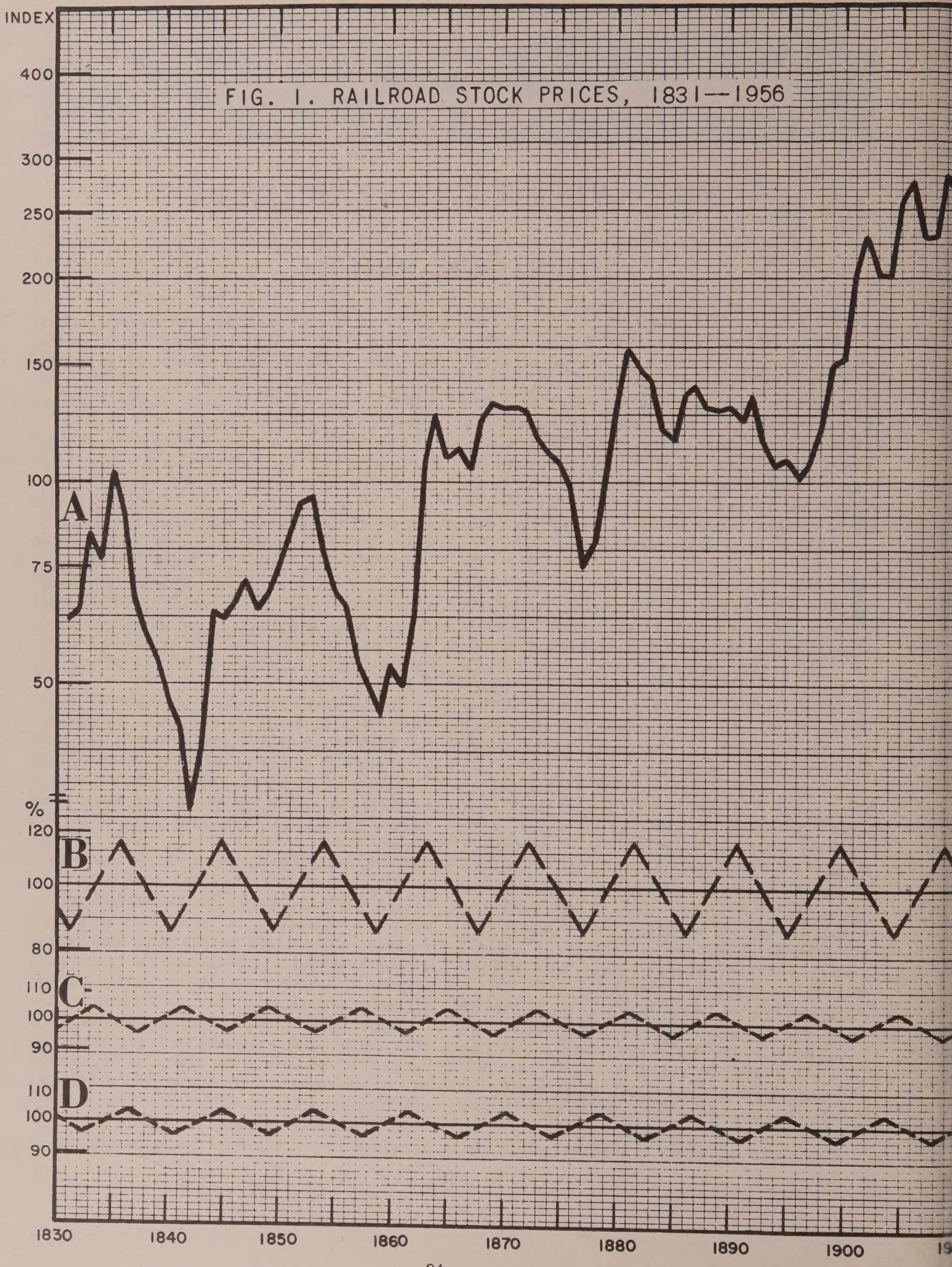
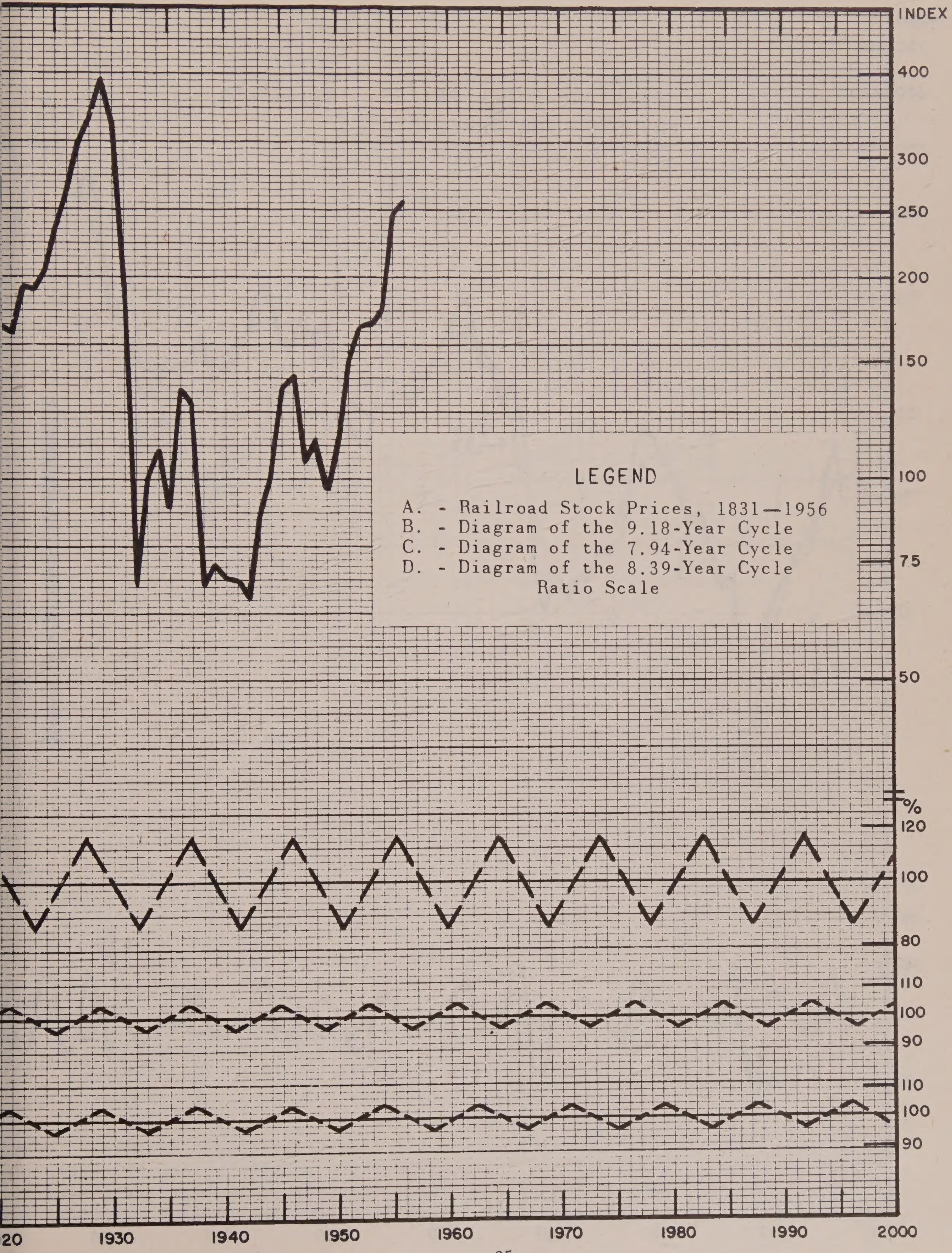


FIG. I. RAILROAD STOCK PRICES, 1831—1956


INDEX
400
300
250
200
150
100
75
50
%
120
100
80
110
100
90
110
100
90
LEGEND
A. - Railroad Stock Prices, 1831—1956
B. - Diagram of the 9.18-Year Cycle
C. - Diagram of the 7.94-Year Cycle
D. - Diagram of the 8.39-Year Cycle
Ratio Scale
20
1930
1940
1950
1960
1970
1980
1990
2000

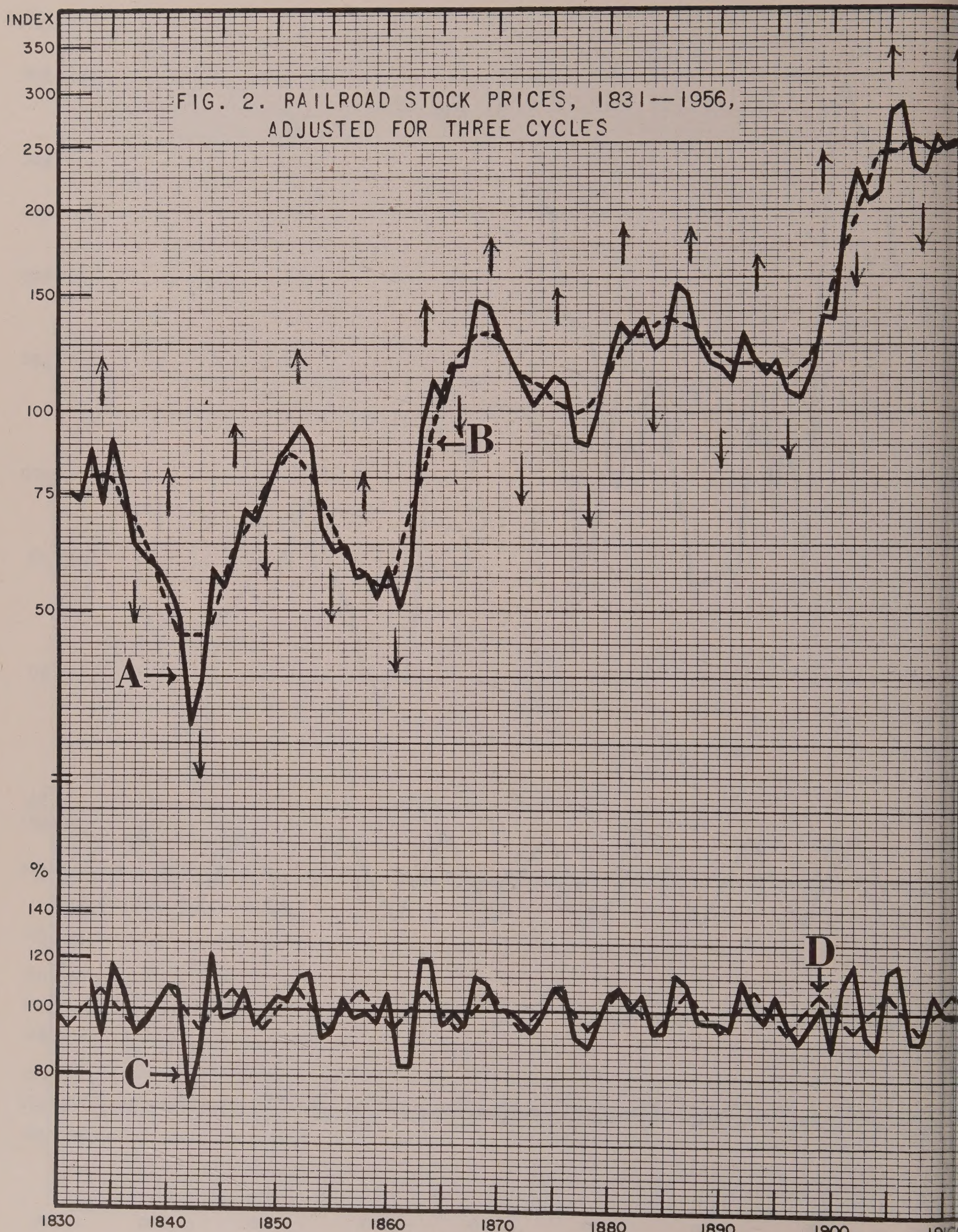
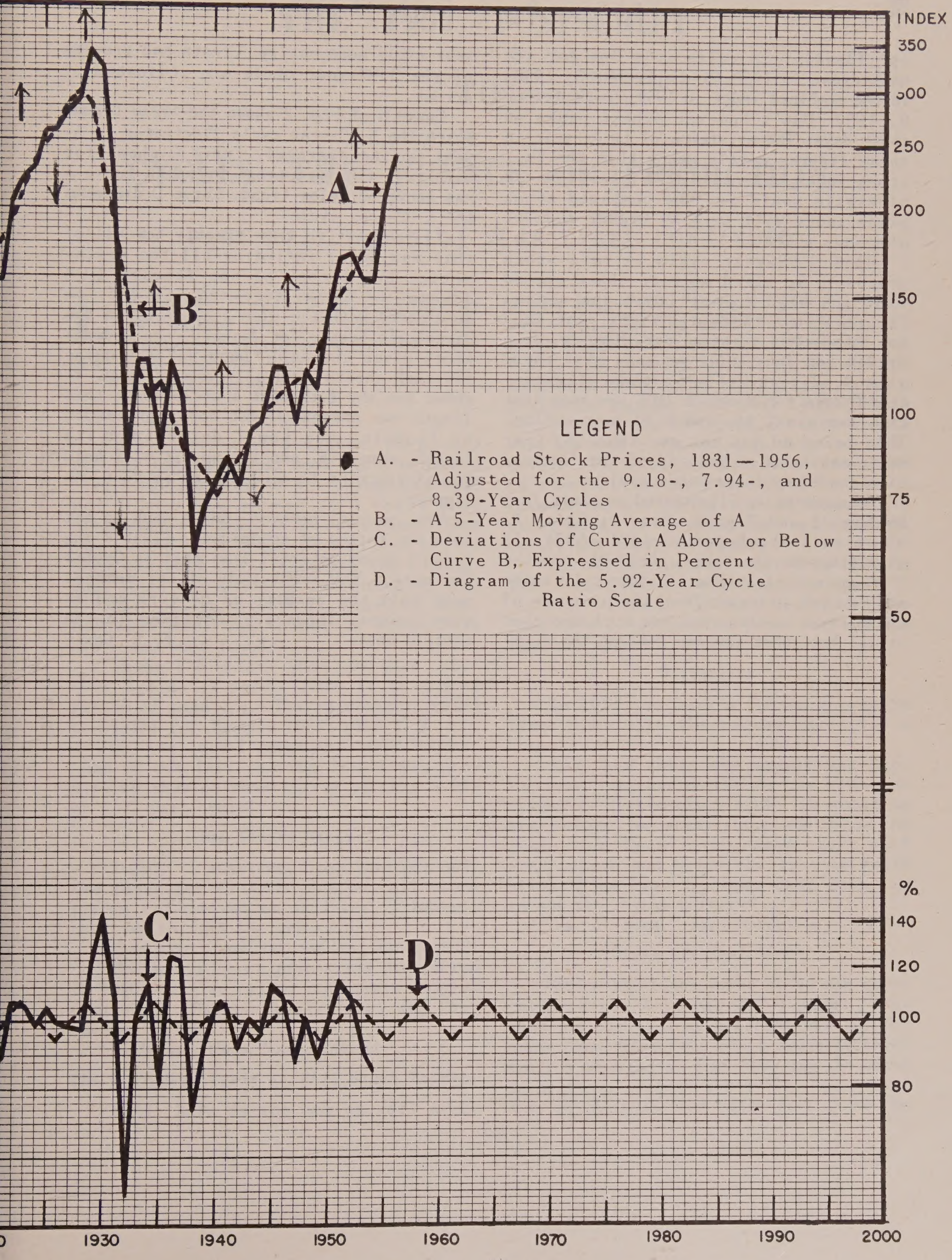


FIG. 2. RAILROAD STOCK PRICES, 1831—1956, ADJUSTED FOR THREE CYCLES



LEGEND

A. - Railroad Stock Prices, 1831—1956, Adjusted for the 9.18-, 7.94-, and 8.39-Year Cycles
B. - A 5-Year Moving Average of A
C. - Deviations of Curve A Above or Below Curve B, Expressed in Percent
D. - Diagram of the 5.92-Year Cycle

Ratio Scale

up. Ideally, in rails it's due for its next crest in 1958.68—September 5, 1958; in the combined index in 1958.69—September 9, 1958. Don't however expect peaks on those days. The existence of this cycle in these figures merely means that the rail stock index will be 8.65 higher *than it otherwise would be*, the combined stock price index will be 6.4% higher *than it otherwise would be*.

This 5.92-year cycle in rail stock prices is so mixed up with other cycles that its hard to see it in the actual figures. It's there all right, but it's too unimportant to stand out. However, from *Cycles* for June 1956 you know that there is a 9.18-year cycle in these figures, from *Cycles* for November 1956 you know that they contain 7.94- and 8.39-year cycles. This being so you can see the 5.92-year cycle easier if we get rid of the fluctuation caused by these other cycles.

The process is illustrated in chart form by Fig. 1 and Fig. 2. Fig. 1, Curve A, shows rail stock prices 1831—1956. It also diagrams the 9.18-, the 7.94- and the 8.39-year cycles. Fig. 2, Curve A, shows rail stock prices after the removal of these three cycles. See how much smoother it is. Note that you can now see the 5.91-year cycle more easily. Crests and troughs of the 5.92-year cycle are indicated by arrows.

Curve B of Fig. 2 shows the trend around which the 5.92-year cycle fluctuates (a 5-year moving average). Curve C shows for each year the percentage by which Curve A was above or below trend. Curve D diagrams the 5.92-year cycle.

If you want to know exactly how all of this was done, including all the arithmetic, buy a copy of the January 1956 *Journal of Cycle Research* ($1.00). In accordance with the plan I spoke of in the Director's Letter for January, the Journal story gives the full "back-up" including all work sheets, and all computations. It shows you why I thought a cycle about this length was present, just how I proceeded to find it, and how I determined its length, strength, and timing. It will help you if you want to find cycles in your own figures.

Most people, however, don't want to get into the matter of techniques. (That's why I don't print material like that in *Cycles* any more.) The great body of our members want only the results of my work and my conclusions. Those are contained in the article above.

E. R. Dewey

THE 1957 POSTSCRIPT

TO

CYCLES—THE SCIENCE OF PREDICTION

PART XII: THE 5.91-YEAR CYCLE CONTINUED

"LET's see," said Robert Steele as we resumed our talk about cycles, "you were telling me about the 5.91-year cycle, weren't you?"

"Yes," I answered.

Review

"Let's review it a little. We missed getting together last week and I'm afraid I've forgotten some of the things you told me. I know you showed me a chart that diagrammed all these 5.9-year cycles. Then you showed me a table that listed all of them and told their strength and timing. Then there was a list of references so that I could look up details in regard to each. But what were the things in which this cycle had been found?"

"Maybe I'd better show you that table over again," I said. "Here it is." [See bottom of page 101. For references, refer to *Cycles* for January 1957, page 21.]

"Oh, yes, now I remember," said Robert. "And at our last meeting didn't you promise to show me some charts of this 5.91- or 5.92-year cycle?"

Two Charts Ready

"I did," I answered, "but I've got only two ready for you—the one on rail stock prices and the one on failures. I haven't had time to work the others up."

"When were these two cycles discovered?"

"The one in stock prices was discovered in 1950—only we called it 6 years long at that time. The one in failures was discovered in 1953."

"Let's see them," said Robert.

The 5.92-Year Cycle in Rail Stock Prices.

"Well, here is the one on rail stock prices 1831—1956," I said. [See Fig. 1 on pages 102-3] "The solid line shows rail stock price behavior after adjustment for 9.18-, 7.94-, and 8.39-year cycles and for long term trend. The broken line shows a perfectly regular 5.92-year cycle. It is extra heavy for the past seven years to show how this cycle has unfolded since discovery. The cycle is distorted from time to time, but after distortion it always resumes the old timing. On the whole it is quite good. It is much too regular to be easily the result of chance."

"The solid line runs only from 1833 to 1954." said Robert, examining the chart.

"Yes," I said. "I don't dare guess the long term trend for the first two and the last two years."

Distortion

"In 1834 you have a low on the solid line, just when the zigzag calls for a high."

"Yes, and there are many other distortions, too, but on the whole a 5.92-year rhythm is distinctly visible. Remember we are looking for *areas* above and below the line, too. Here is the same chart with areas above and below the line in solid black. [See Fig. 2.] Does that help you to see the rhythm better?"

"Yes, it does," said Robert

Areas are What Count

"Notice the black areas above the curve lettered big **A** to big **Z**," I said. "They show you the plus or positive part of the cycle. Now notice the black areas lettered small **a** to small **z**. They show you the minus or negative part of the cycle. Now notice how, *in the main*, the black part above the

100% line tends to come at the time of the positive part of the cycle, how, *in the main,* the black part below the 100% line tends to come at the time of the negative part of the cycle.

The Higher

"Look at it in detail," I continued. "Take the part above the 100% line first. Look at block **A**: In spite of your low in 1834, the bulk of the block from 1832 to 1835 is above the line; **B** is good; **C** has a double top; **D** is good; **E** is nothing much, one way or the other; **F** is good; **G** is good; **H** is good; **I** is good; **J** is good; **K** has a double top and is fair; **L** is poor; **M** is good; **N** is nothing; **O** is good; **P** is good; **Q** is good, but a shade late; **R** has a double top, **S** is good; **T** is early; and **U** is early.

The Lows

"Looking now at the lows," I went on, "**a** is good; **b** is good; **c** is weak, but good as far as it goes; **d** is good; **e** is good; **f**, like c, is weak; **g** is good; **h** is good; **i** is good; **j** is good; **k** is good; **l** is terrible; **m** is good; **n** is nothing; **o** is good; **p** is nothing; **q** is good, **r** is mixed —part bad and part good; **s** is nothing, **t** is good; **u** we don't yet know about."

"I see," said Robert, "and I suppose you can set "goods" against "bads" and come up with an average?"

"Yes," I said, "that's about it. If the tendency is definite enough, and has repeated enough times, you can't laugh it off, except at your peril."

"I see that the ideal cycle is above the 100% line from the beginning of 1957 to the beginning of 1960. It seems to reach its crest at about the middle of 1958. From the diagram it seems to have a strength of about 8% above trend at time of crest. Am I right?"

"Approximately. The crest comes ideally at 1958.68. Its strength, ideally, is 8.65% above trend. This of course does not mean that rail stocks will be 8% higher than *now.* It means that if we have typical behavior they will be 8% higher than they otherwise would be. That is, it means that if we let six years go by and bring this chart up to date, the most probable value on the chart for 1958 would be 108.65, that is, 8.65% above trend. Or better yet, if we let 60 years go by, the most probable value for the ten crest years would be 108.65. Some would be above this, some would be below this, but 8.65% above trend would be typical."

"Assuming that the 5.92-year cycle from 1831 through 1956 is not random," interposed Robert.

"Yes," I said, "and assuming further that it continues. Your heart beats are not random, but sometime they are going to stop."

What Good Is It?

"Sooner than I would like!" said Robert. "But be that as it may, granted (1) that the behavior is not random and (2) that it will continue, and (3) even granting that the next time will be typical, what good will it do me to know all this?"

"Putting it another way," Robert continued, "Suppose someone had *complete* foreknowledge and would put up a million dollar guarantee that this curve on this piece of paper, when continued, would, next crest, show 108.65%. So What? How could I cash in on it?"

"With the information above by itself," I answered, "You couldn't. And the reason you couldn't is that you don't know what the long term trend line is going to do. If you knew that, you could back track, add this cycle to the trend, add in the other three cycles, and you'd know what actual prices were going to do. Then you could act accordingly."

Long Term Trend

"How can long term trend be determined?"

"When you find enough of the cycles, and adjust for them adequately, the long term trend line that is left changes its direction only very slowly. When this is so, you can project the long term trend line a short distance into the future, add the cycles back in, and have a forecast. Clear?"

"I guess so," said Robert. "What it boils down to is this, that a knowledge of one cycle by itself isn't much good to anybody, but that you can put several cycles together to get something of value. Do I have it right?"

"Pretty nearly. However, a knowledge of even one cycle by itself is of value if that one cycle is strong enough to dominate the picture. In rail stock prices, the 5.92-year cycle is not."

"Can you see this 5.92-year cycle in a chart of the actual figures before adjustment for the effect of the three cycles you mentioned and before adjustment for the effect of long term trend?"

"You can see traces of it here and there but it isn't clear enough to carry any conviction, until you remove some of the other cycles and trend."

"I'd like to see a chart of the actual figures and know more about these adjustments you made. I get out of my depth when we get away from the actual raw unadjusted values."

Techniques Explained Fully in the Journal of Cycle Research

"Certainly," I said. "Here's a copy of the *Journal of Cycle Research* for January 1957 when I used 16 pages to go into *full* detail (including *all* the arithmetic) regarding the detection, isolation, and definitization of this 5.92-year cycle in rail stock prices. That article will tell you exactly what I did and how I did it."

"Is the *Journal of Cycle Research* another one of your publications?"

"Yes, we have two. *Cycles*, a blue covered monthly magazine that goes to our members and the *Journal of Cycle Research,* a white covered quarterly magazine available on subscription. The *Journal* is a bit more technical. It costs $1.00 a copy or $4.00 a year."

"Put me down for the *Journal.*"

"I'd love to. Now, going back to the 5.92-year cycle in rail stock prices there is a story about it in *Cycles* too. [See "The 5.91- or 5.92-Year Cycle in Stock

SUMMARY

5.91-Year Cycle

Ref.	Phenomena	Span of Years	Cycle Length	Time of Current Crest	Strength vs. Trend	
					Above	Below
					Index of 1	
1	Sunspots, with Alternate Cycles Reversed, 1749—1937	189	5.90	1955.61		
2	Tree Rings at Fairlee, Vermont, 1544—1934	391	5.933	1957.35	u	u
3	Liabilities of Business Failures, 1857—1953	97	5.9	*1958.65	12.5	11.1
4	Index of Railroad Stock Prices, 1831—1956	126	5.92	1958.68	8.6	8.0
5	Combined Index of Stock Prices, 1871—1956	86	5.91	1958.69	6.4	6.0
6	Cotton Prices, 1731-32—1949-50	219	5.91	1959.28	6.7	6.2
7	Pig Iron Prices, 1784—1953	170	5.91	1959.525	5.5	5.1
8	Copper Prices, 1784—1953	170	5.91	1959.89	5.6	5.3
9	European Wheat Prices	300	5.96	u	u	u
10	Barometric Pressure in Batavia, 1866—1940	75	5.97	u	u	u
11	Index of Industrial Stock Prices, 1871—1950	80	5.93	u	u	u
12	One half Siderial Period of Jupiter	—	5.931	u	u	u
12	One fifth Sidereal Period of Saturn	—	5.892	u	u	u
12	One forty-second of the Sidereal Period of Pluto	—	5.915	u	u	u

* trough

u unknown

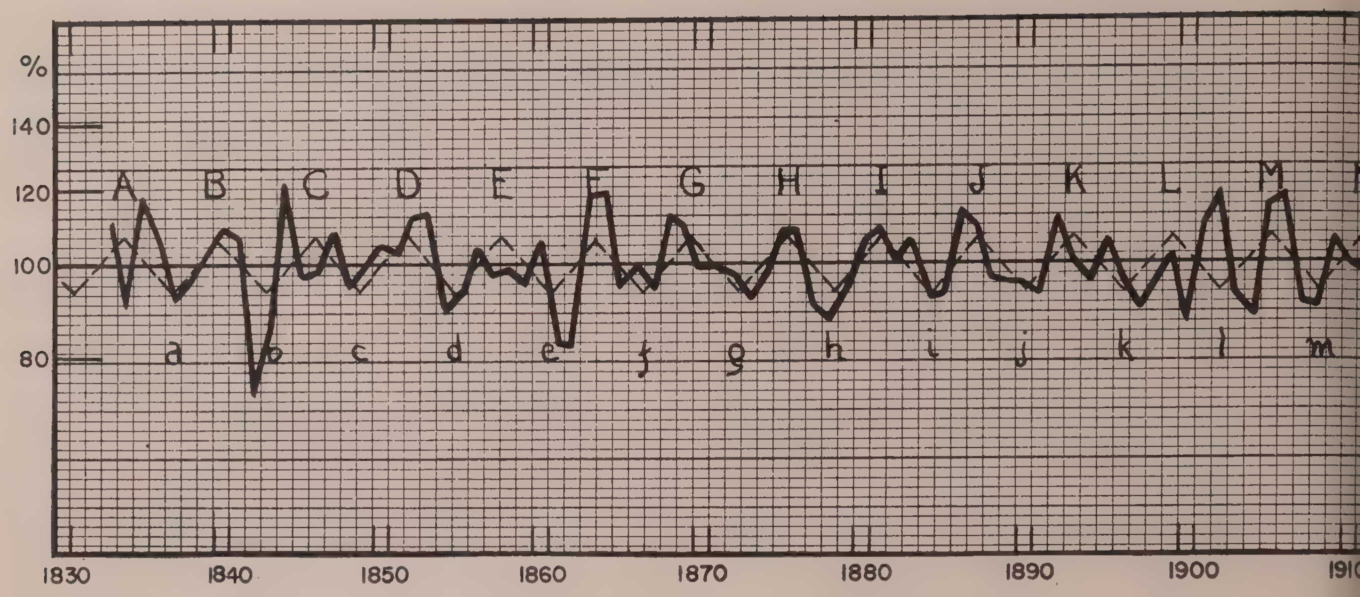


FIG. 1. THE 5.92-YEAR CYCLE IN

This chart shows rail stock prices, 1831—1956 adjusted for the effect of perfectly regular 9.18-, 7.94-, and 8.39-year cycles and for a 5-year moving average trend. The first two and the last two values are missing because trend cannot

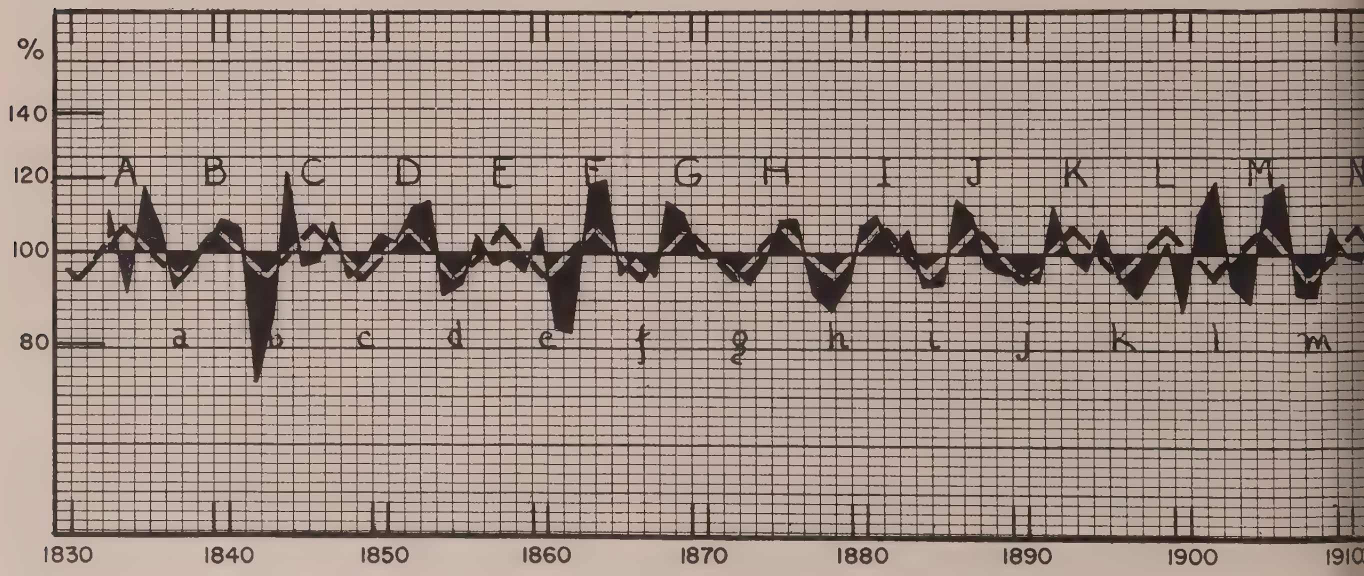
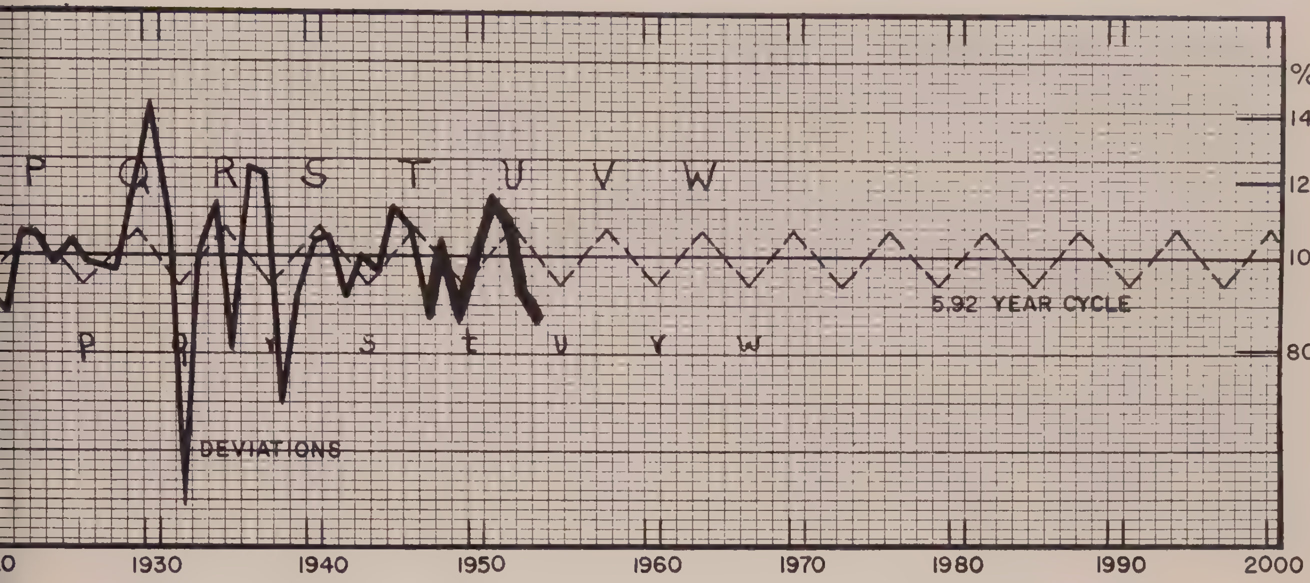


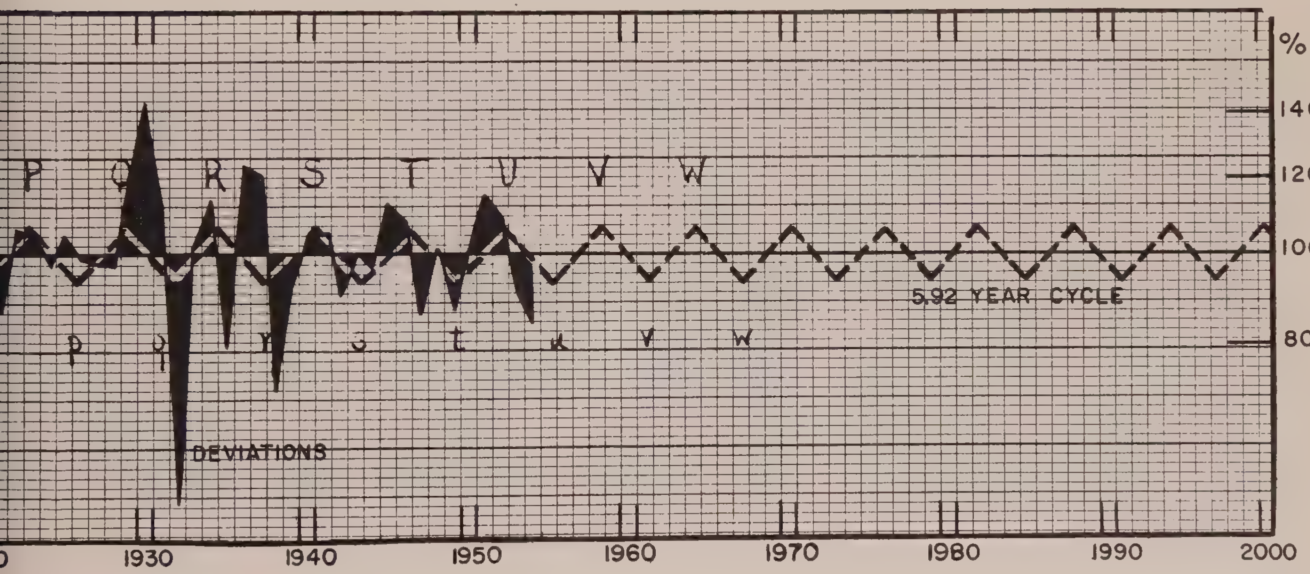
FIG. 2. THE 5.92-YEAR CYCLE IN

This chart is the same as that of Fig. 1 except that the areas above and below



RAIL STOCK PRICES, 1831--1956

be computed for these years. The line from 1947 forward is heavier to show how this cycle has come out since discovery. Ratio Scale.



RAIL STOCK PRICES, 1831--1956

the axis have been shaded so that you can see the cycle better. Ratio Scale.

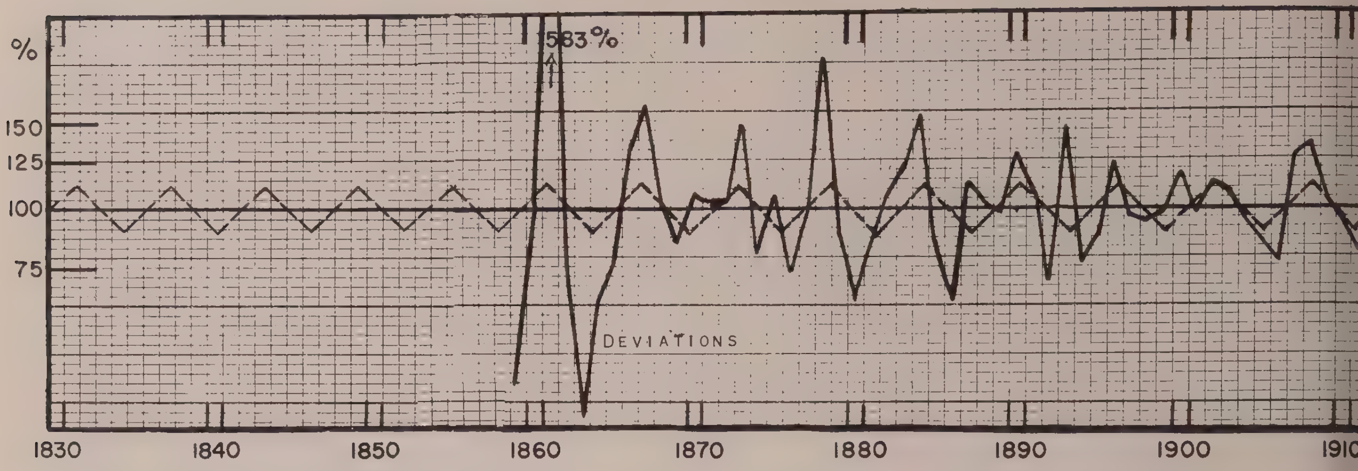


FIG. 3. THE 5.9-YEAR CYCLE

This chart shows the liabilities of commercial and industrial failures, 1857—1956 adjusted for the effect of 3.42-, 9.2-, and 17 3/4-year cycles and for a 5-year moving average trend.

The first two and the last two values are missing because trend cannot be computed for these years.

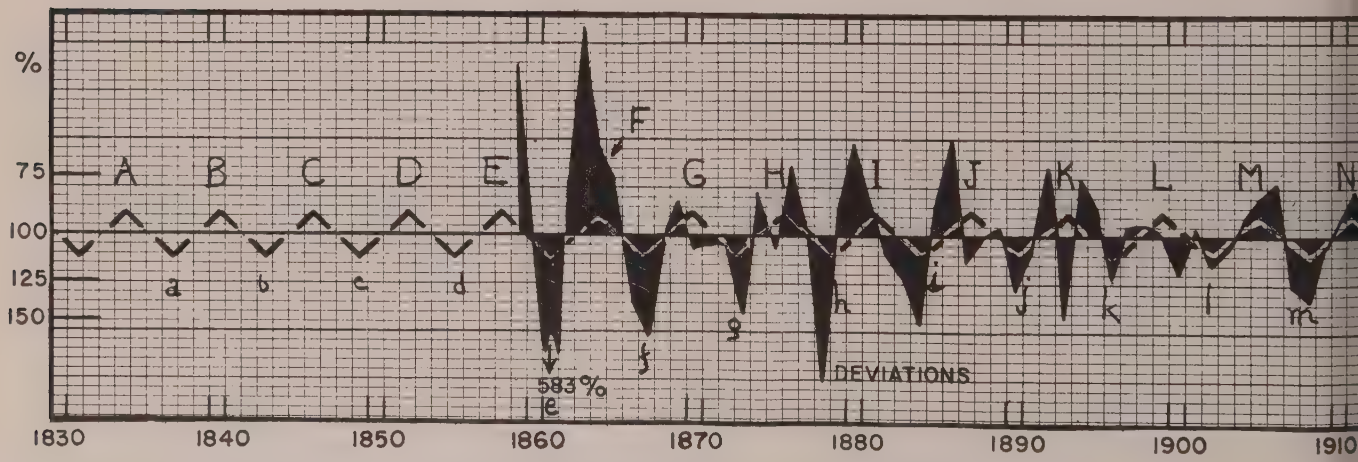
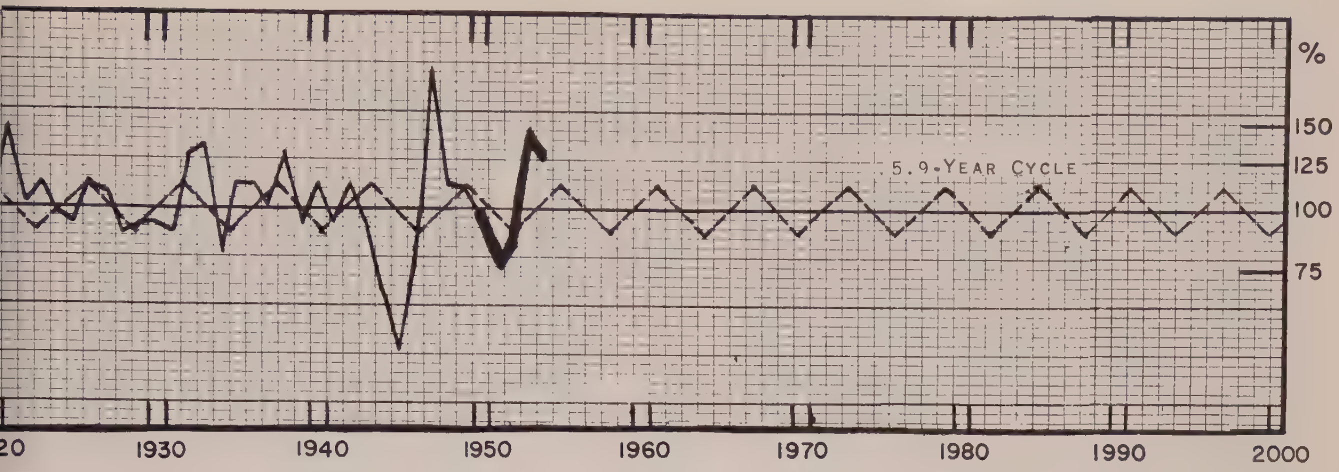


FIG. 4. THE 5.9-YEAR CYCLE IN

This chart is the same as that of Fig. 3 except that it has been turned upside down so that few failures (good) will be above the axis and lots of failures (bad) will be below the axis.

Areas above and below the axis have

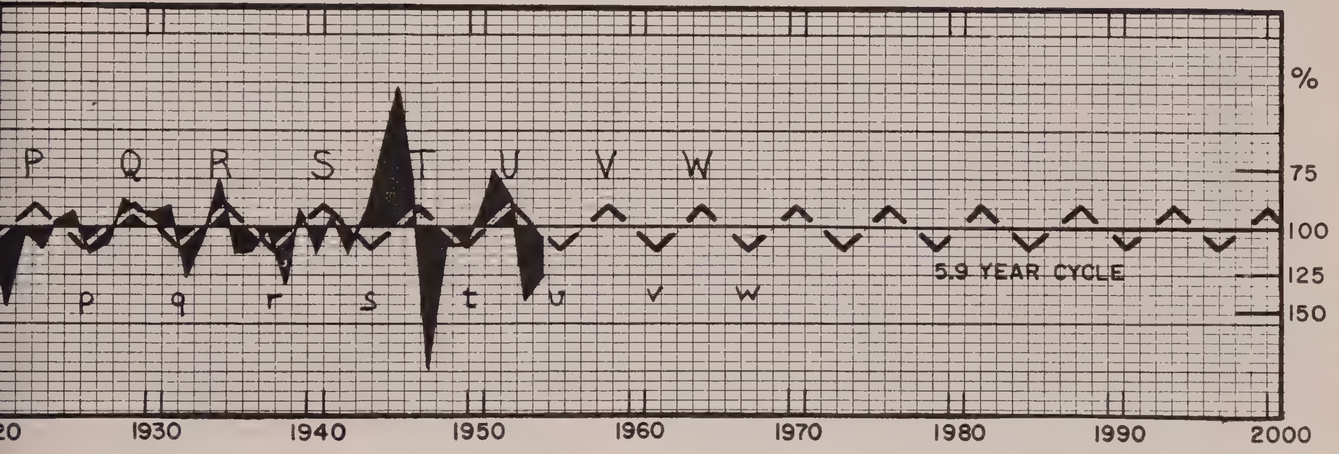


IN FAILURES, 1857--1956

The line from 1950 forward is heavier to show how this cycle has come out since discovery.

The zigzag line diagrams a perfectly regular 5.9-year cycle. It is projected to show the future course of this cycle.

Ratio Scale.



FAILURES, 1857—1956, REVERSED

been shaded so that you can see the 5.9-year cycle better.

This chart can be compared with the chart on pages 102 and 103 showing the 5.92-year cycle in rail stock prices.

Ratio Scale.

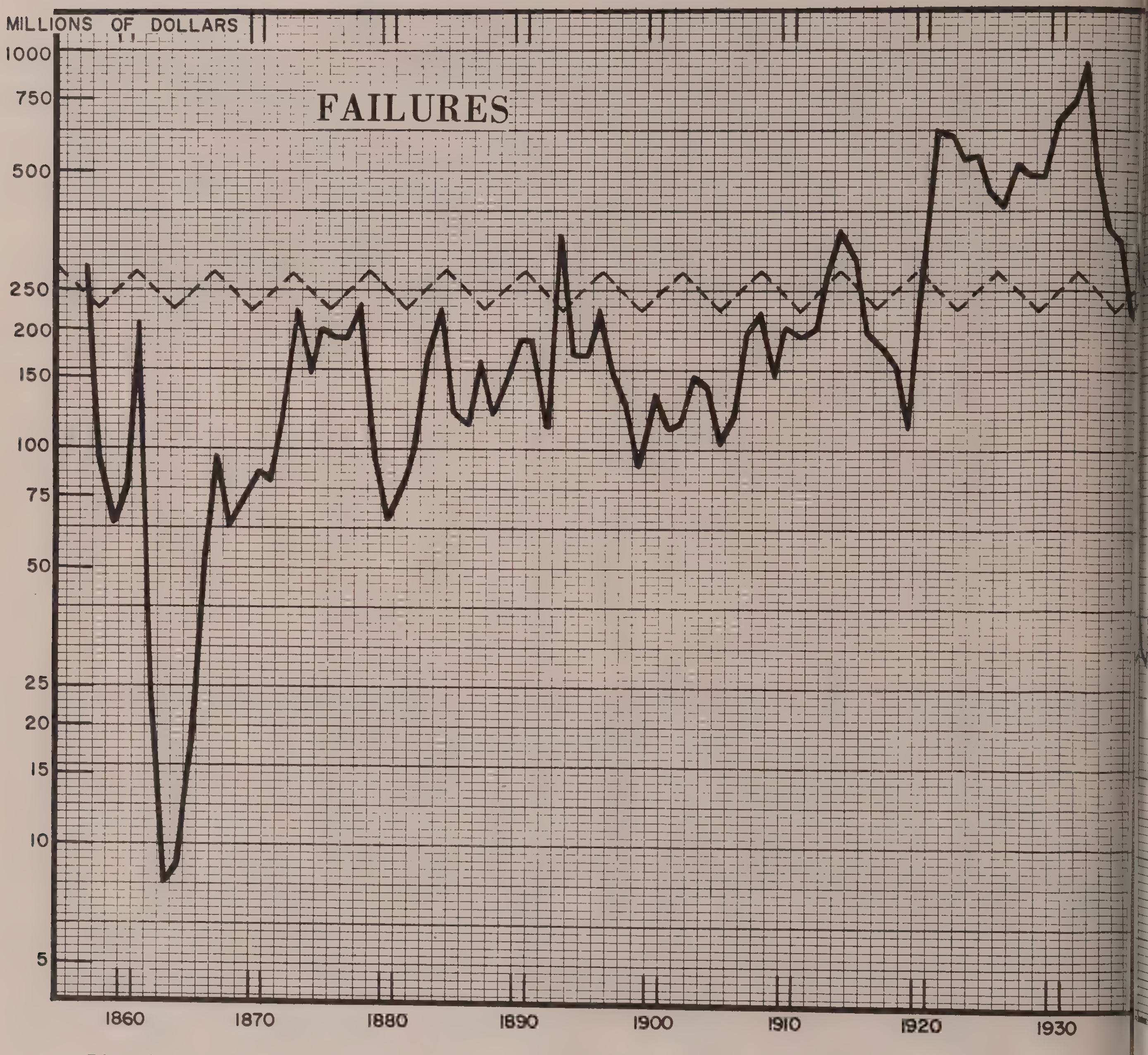
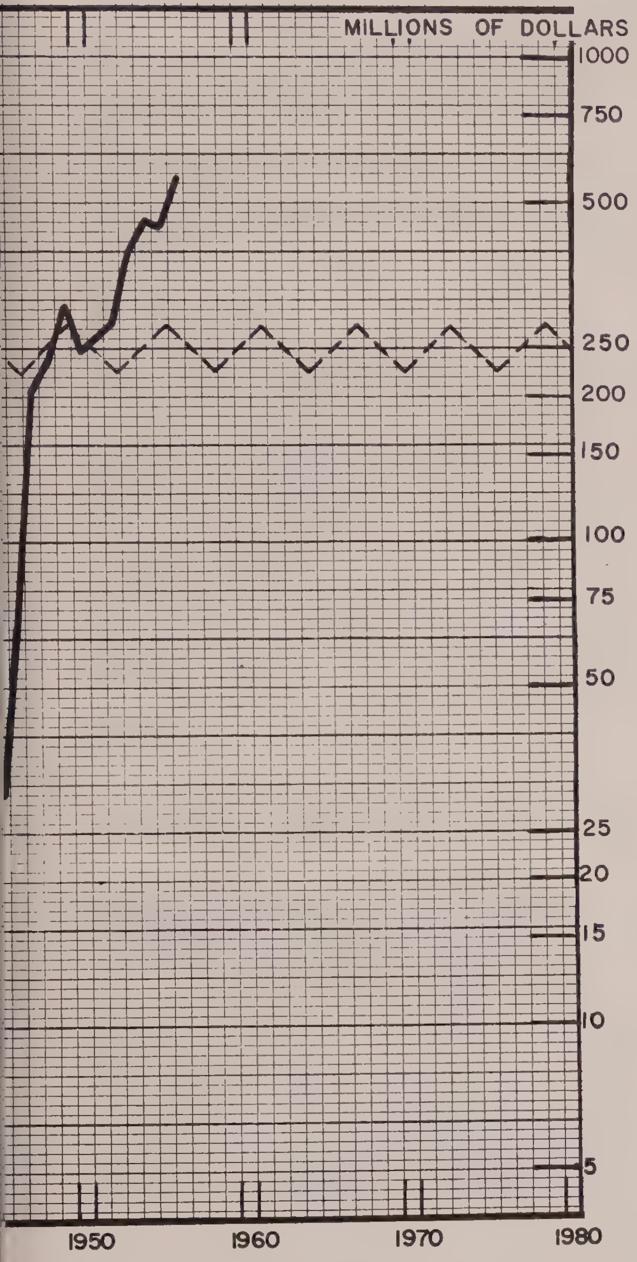


Fig. 5. Liabilities of Commercial and Industrial Failures, 1857—1956

The broken line diagrams a perfectly regular 5.9-year cycle. Note that in most instances corresponding increases and decreases of the failure curve are visible.

Remember that failures are upside down relative to general business. When business is up (good) failures are down; when business is down (bad) failures are up. Ratio Scale.



Prices" printed in this [April 1957] issue of *Cycles*.] It is only a six-page story. It doesn't go so much into the arithmetic and the techniques.

The 5.9-Year Cycle in Business Failures

"You said you had a chart on this same cycle in business failures." said Robert. "Failures interest me. What figures do you use?"

"The liabilities of commercial and industrial failures as published by Dun & Bradstreet from 1857 to date. It's a very good series of figures—it's now 100 years long."

"Why couldn't you use just the *number* of failures? Wouldn't that do? If you used just the number your figures would not be complicated by price changes, inflation, and the like."

Liabilities of Failures Used as an Index

"I've tried *number* of failures, but the cycles aren't anywhere nearly as plain as in the liabilities of failures."

"I should think failure figures would give a pretty good index of business conditions."

"They do, except that you have to remember they are upside down in respect to business—that is, when failures are up business is down; when failures are down, business is up."

"Is the 5.9-year cycle pretty good in these figures?" asked Robert.

5.9-Year Cycle Good

"Yes, as these things go," I answered. "Of course there are a lot of other cycles in this series of figures, and randoms too. They cloud the picture in the actual figures. However, if you adjust for some of the other cycles you can see the 5.91-year cycle quite clearly. Here for example is a chart of the liabilities of commercial and industrial failures, adjusted for the 41-month, the 9.2-year, and the 17¾-year cycles, and for long term trend [See

Fig. 3] This chart covers the period 1857 through 1956, except of course for two years at each end where I didn't venture to guess the long term trend."

"The broken zigzag line diagrams a perfectly regular 5.9-year cycle," I continued, "The heavy line from 1950 through 1954 shows how the events have unfolded since this cycle in these figures was first discovered in 1953."

"I liked that chart of stock prices you showed me where the areas above and below the 100% line are made solid black. It makes the cycle easier to see. Do you have a chart like that of failures?"

Area Charts

"I like charts like that too, Yes I do have one of failures. Here it is. [See Fig. 4.] However, as failures are upside down in relation to stock prices and other things, I've turned this chart upside down so you can compare it more easily with stock prices. Let me explain further: When things are bad stock prices are down and failures are up. Lots of failures are bad. By turning the chart upside down we get lots of failures (bad) below the line just like low stock prices (also bad). I hope this doesn't mix you up?"

"No," said Robert. "it's quite clear and much easier to compare the two curves. I see you lettered the areas above and below the line just as in stock prices."

The Record

"Yes." I answered. "That's to make comparison easier. Now let's look at the record: Let's take the capital letters first; **E** is excellent; so is **F**, **G** is nothing much, one way or the other; **H** is fair; **I** and **J** are good, but in each instance a bit early; **K** and **L** I'd call poor; **M** is good; **N** is good; **O** and **P** are poor; **Q** is good; **R** and **S** are neither one thing nor the other; and **T** is pretty fair. Now taking the small letters, **e** is wonderful; **f**, excellent; **g**, good, **i**, good, but a bit early; **j**, good; **k**, good; **l**, good; **m**, wonderful; **n**, fair, but a little late; **o**, poor; **p**, good; **q**, fair, but a bit late; **r**, good; **s**, poor; **t**, good.

"Of course," I continued, "These are all subjective opinions. The mathematical tests are objective and show what the length and other characteristics really are."

"What are they?"

"It's shown in the table. [See table on page 101.] Length 5.9 years, time of current trough, 1958.65, strength at time of crest, 12.5%, shape zigzag."

"Do you know," said Robert, "I get lost in all this maze of charts and figures. I can't get it out of my head that all these adjustments for other cycles and for trends and all that sort of thing maybe make these rhythms. Maybe you are just having fun with figures!"

The Actual Data

"I know how you feel," I said. "Would it make it any more convincing for you if I showed you a chart with nothing removed. This curve [Fig. 5] is not reversed [like Fig. 4]; it's right side up [like Fig. 3] On Fig. 5 I've put a 5.9-year zigzag. You *can* still *see the* cycle, though of course not so plainly."

"By Jove! so you can," said Robert. "Why don't you always show the cycle in charts of the actual figures?"

"Well, sometimes the cycle is so unimportant that you can't see it unless you do something to minimize other cycles and/or randoms. But even, as here, where you can see it, the object is not to *see* the cycle, but to *study* it—to find out its length, strength, timing, etc. You simply cannot do that in the raw figures.

"Yes," said Robert, "I see. When you get the exact length and timing you can see which comes first. You can perhaps tie it to a cause. You will have the beginning of a science of cycles!"

"Exactly!" I said. "You have the picture perfectly."

"Now let me see some more," said Robert.

"No, not today," I answered. "That's all I've got ready for you."

"What's next?" said Robert.

"Well, I thought I'd give you a little change from the 5.9-year cycle. I had in mind to bring up to date a study of business failures I made four years ago. It took several cycles into account. I'd like to show you how it came out. I'd like to show you the light it throws upon the future."

"That would be fine." said Robert. "Please do that for next time."

"I will," I answered.

E. R. Dewey

THE MODIFIED GEISINGER INDICATOR

BACKGROUND

THE Modified Geisinger Indicator is a series of numbers which, in the past, have gone up and down ahead of corresponding movements of the Federal Reserve Board Index of Industrial Production. Thd Modified Geisinger Indicator thus throws some light on the probabilities of the future.

The F. R. B. Index of Industrial Production measures physical production in the U. S. A. It is a weighted average of tons, yards, gallons, and numbers of things produced each month.

The Modified Geisinger Indicator is the sum of two Indicators, the Geisinger Indicator and a First Difference Indicator.

The Geisinger Indicator was invented by Robert Geisinger. It is derived from figures which are published each month in the *Survey of Current Business*. It is charted for you as Curve A on pages 114 and 115.

Curve B on these same two pages charts the First Difference Indicator, which is merely the amount by which the smoothed F. R. B. Index is above or below the value for the preceding month. The smoothing is effected by means of a centered 3-month moving average and a 2-month moving average posted to the second position.

Curve C charts the sum of the values of Curves A and B. This curve is called the Modified Geisinger Indicator. It suggests in a general way what the F. R. B. Index may do some eight months later.

Curve D charts the values of the F. R. B Index of Industrial Production.

Curve E re-charts curve C, advancing it by 8 months. This advance is for two reasons (1) so that you can more easily compare the past behavior of the Modified Geisinger Indicator with the behavior of the F. R. B. Index, and (2) so that you can have a better idea of what the F. R. B. Index may do in the future.

FORECAST

THE indicators continue to suggest caution. It certainly looks as if the peak were passed.

The Geisinger Indicator continues to decline. The value for November 1956 (July 1957 when advanced) is -1.6. (Curve A)

The First Difference Indicator (Curve B) also declined.

The sum of the two The Modified Geisinger Indicator (Curve C), declined likewise. Curve E shows these values advanced 8 months.

The actual figures for each of the last few months are shown in the table below.

The Federal Reserve Index of Industrial Production (Curve D) continues at 146.

The charts referred to above will be found on pages 114 and 115.

E. R. Dewey

March 28, 1957

Month	8 Months Later	Geisinger Indicator	1 st Difference Indicator	Modified Geisinger Indicator
Sept. 1956	May 1957	-.2	2.33	2.13
Oct. 1956	June 1957	-.8	2.33	1.53
Nov. 1956	July 1957	-1.6	1.00	-.6
Dec. 1956	Aug. 1957	*	0.33	*
Jan. 1957	Sept. 1957	*	0.00	*

* Not yet available

THE BEGINNER'S CORNER

RATIO LINE CHARTS

LAST month we discussed arithmetic line charts. This month I would like to discuss *ratio* line charts.

The general type of chart we are considering are *time series* charts and we divide these into two types: (a) arithmetic charts and (b) ratio charts.

In both cases time is represented horizontally across the page by equally divided spaces. In both cases the data are plotted, point by point across the page, one reading for each time period. In both cases the plots are connected by a line to make a curve.

Thus time series charts, either arithmetic or ratio, show the fluctuation of a series of data over a period of time. Most of the charts in *Cycles* are time series charts.

(It is of course possible to show data by time periods on other types of charts (bar charts, etc.) but we are deliberately limiting our discussion to the type defined.)

The difference between the arithmetic and ratio charts is in the vertical scale. One has an arithmetic vertical scale - the other has a ratio vertical scale. The arithmetic vertical scales show equal spaces for equal arithmetic differences between the numbers on the scale. The ratio scale shows equal spaces for equal ratios between the numbers on the scale. Consider the illustration called Fig. 1.

On the arithmetic scale, by definition and as illustrated on the chart, there is an equal amount of space between 0 and 10, between 10 and 20, etc. Regardless of how far up the page the scale goes, it will always show $10 difference for each quarter inch.

But, on the ratio scale each quarter inch represents an amount ten times as great as the one below it. The ratio of 1 to 10 is the same as the ratio of 10 to 100 which is the same as the ratio of 100 to 1000 (etc.).

Each ratio, 1 to 10, in whatever terms, covers the same space on the chart.

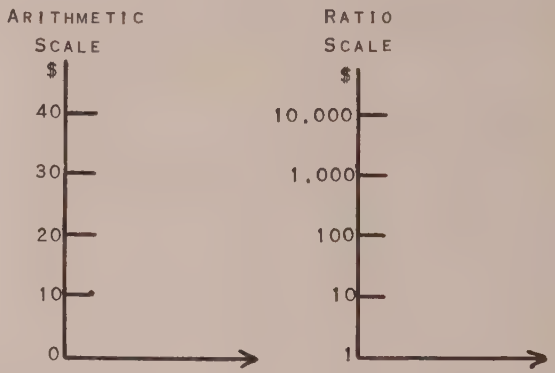


Fig. 1. The Arithmetic Scale and the Ratio Scale Illustrated.

On the ratio scale in Fig. 1 there are four divisions, each ten times the other, so it is called a four cycle ratio chart.

The advantages of this ratio scale are evident. If a series includes numbers as 10, 30, 40, 20 and *also* 1000, 3000, 500 and if you want to see the amount of fluctuation in both groups you cannot do it on an arithmetic chart unless you use wallpaper. To get 3000 in the vertical scale and to get 10 and 30 in it also would require too high a scale.

Conversely, if you see an increase from 10 to 30 on an arithmetic scale, and on the same scale, see an increase from 1000 to 3000 the second increase will be a jump many times as great as the first, yet percentagewise the increase is the same.

On a ratio scale the increase from 10 to 100 covers exactly the same space on the chart as an increase from 100 to 1000.

The ratio scale shows schematically that 10 is to 100 as 100 is to 1000.

The ratio scale above starts with 1. It could start with any number, but not zero because you cannot figure a ratio on zero. Several 4-cycle ratio scales are shown in Fig. 2.

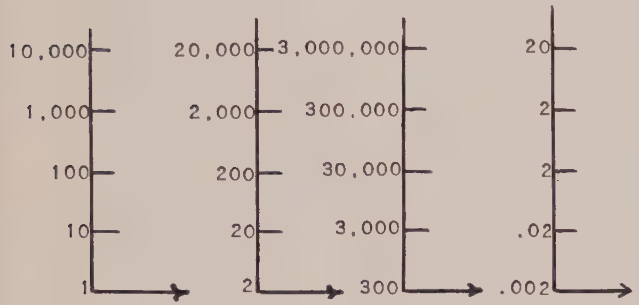


Fig. 2. Samples of 4-cycle ratio scales. Note that scales are *always* converted from one to another by multiplication—never by addition.

If you wanted to plot a series using the first (4-cycle) ratio scale of 1, 10, 100, etc. but had figures coming between the divisions 1, 10, 100, etc. you would not know where to put them.

The space between 1 and 10 must in turn be divided so that the ratio scale is maintained within the cycle. Here is a one-cycle subdivision as shown in Fig. 3.

You see by the scale that 1 is to 2 as 2 is to 4 as 4 is to 8 - again equal distances represent equal ratios.

If we add a second cycle on top of the one cycle above you will find that the distance from 8 to 16 is the same as it was from 4 to 8. That is, the proportionality is maintained among, between, and within the cycles.

A sample of one-cycle ratio paper is shown on page 112.

A sample of two-cycle ratio paper is shown on page 113.

Lines between cycles are accentuated. Within each cycle, all the subdivision lines that it is practical to show are shown.

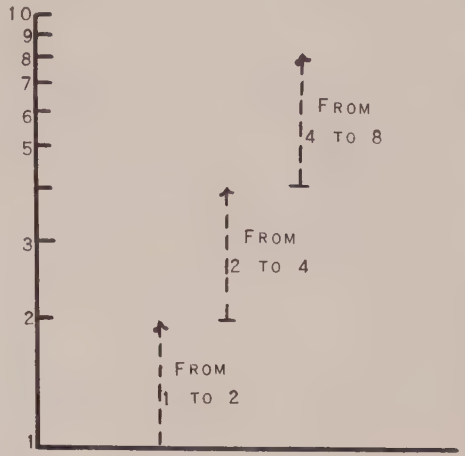


Fig. 3. Sample of 1-cycle ratio scale, showing subdivisions. Note that equal vertical distances represent equal percentage change.

You will observe that the value of the distances between equal numerical values change. This means that the value of the subdivision lines change. These changes have to be watched carefully to avoid errors in plotting.

You will observe also that you can make the scale to fit any range of values you choose by using the proper number of cycles. You set up the scale within the range chosen by multiplying the faint guide scale printed on the chart by the appropriate number.

You will observe that both charts have a polypurpose scale across the page horizontally. You can set up whatever time scale is convenient. However, ratio paper can be obtained with various time subdivisions marked across the horizontal scale, for example months.

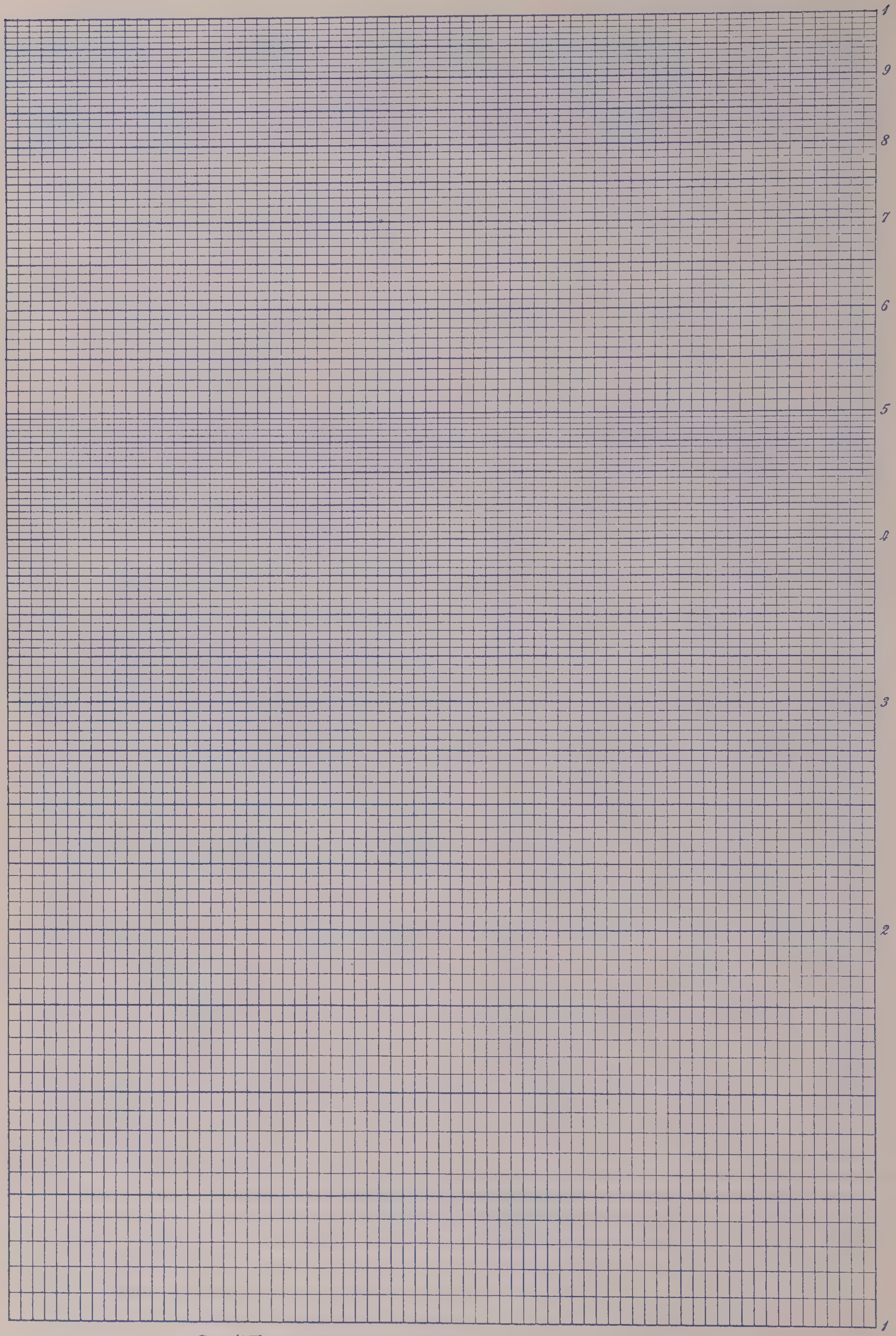
This article is concerned with the basic mechanics of ratio charts - where the scale lines are put on the chart and why.

Space limitations require us to delay further explanations and details about ratio charts until next month. There is much more to the complete story of ratio charts.

G. Shirk

SAMPLE OF 1-CYCLE RATIO CHART PAPER

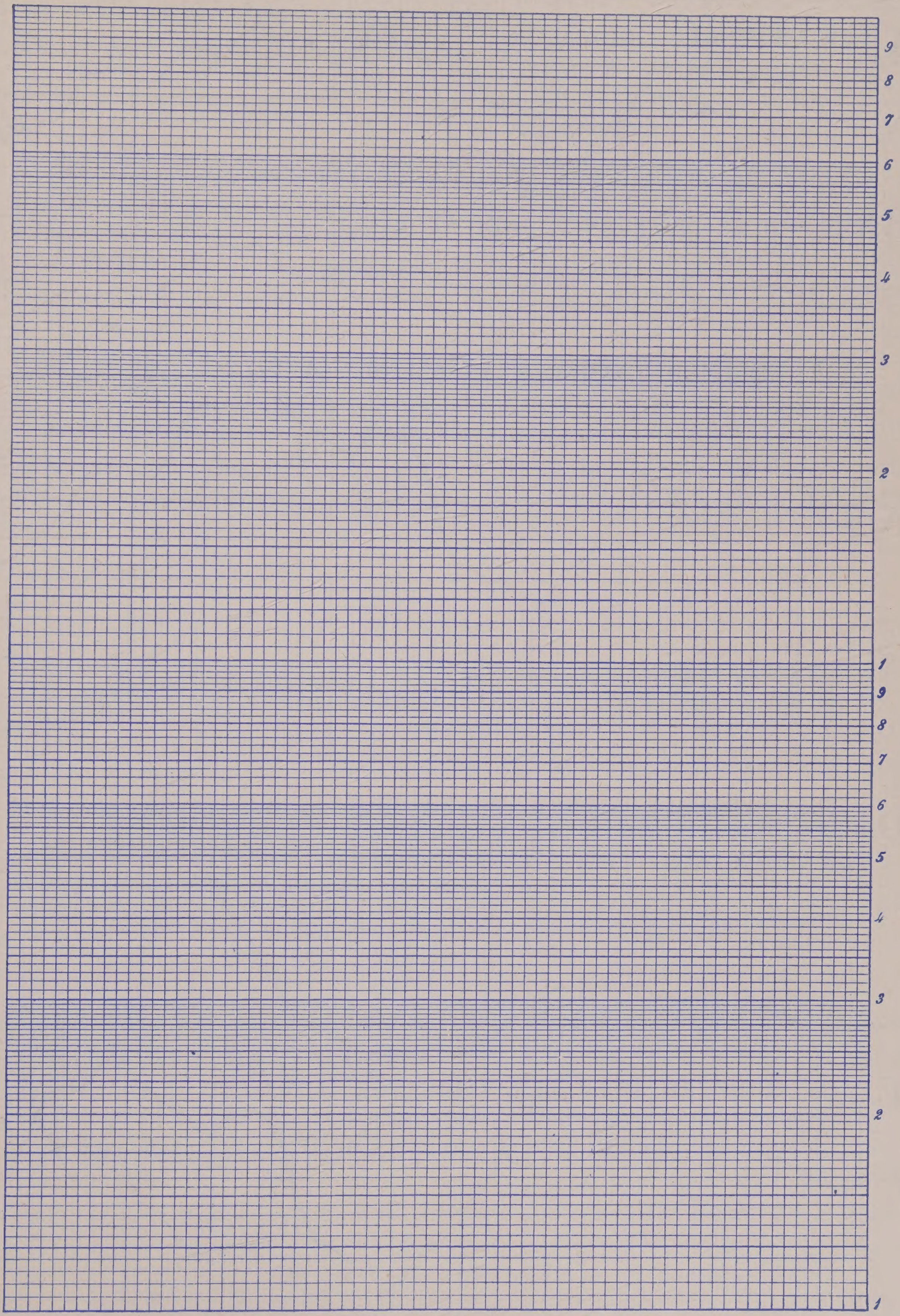
Horizontal scale, polypurpose. Vertical scale, 1 9-inch cycle, ratio ruled.



See "The Beginner's Corner," pages 110 and 111.

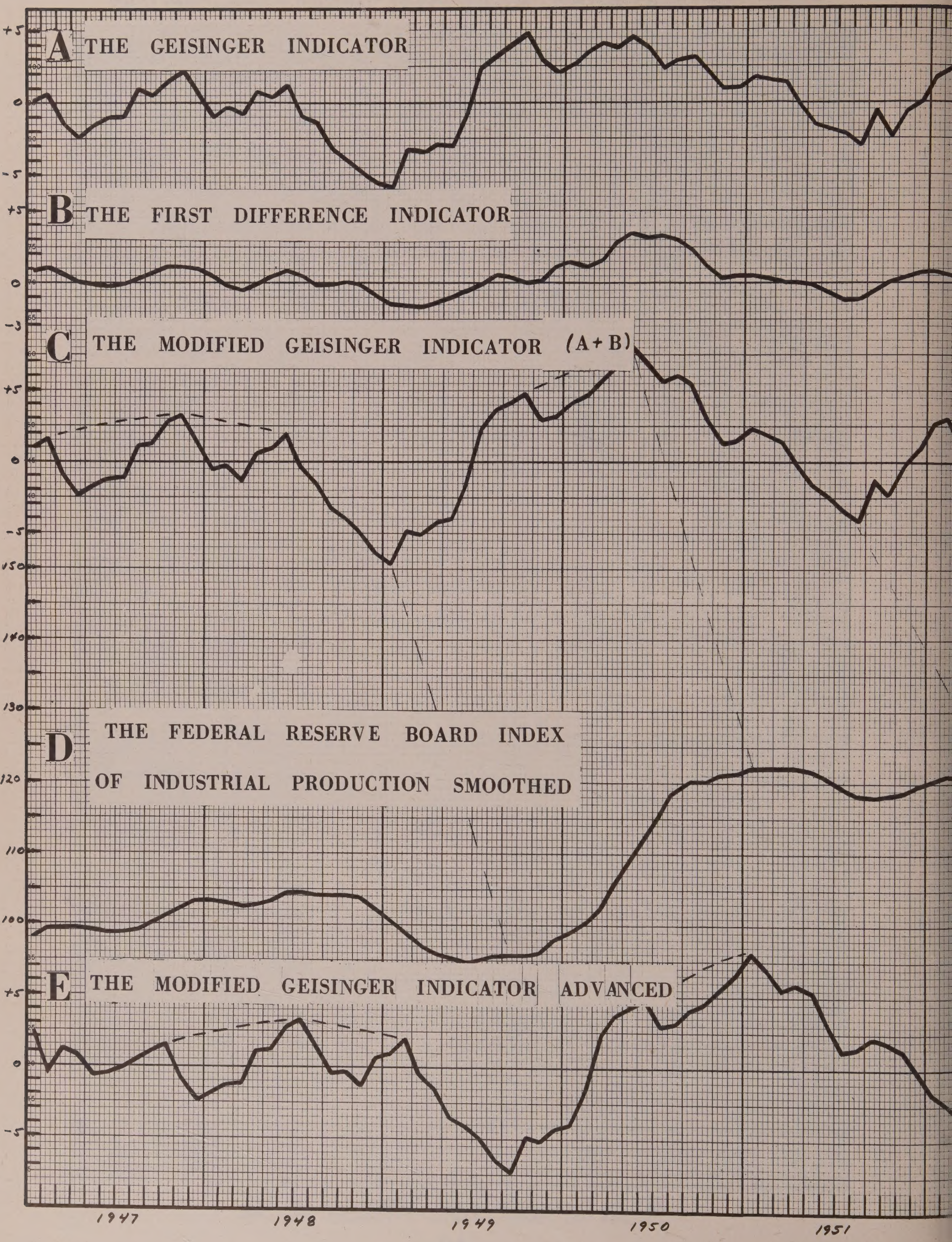
SAMPLE OF 2-CYCLE RATIO CHART PAPER

Horizontal scale, polypurpose. Vertical scale, 2 4½-inch cycles, ratio ruled.



See "The Beginner's Corner," pages 110 and 111.

THE MODIFIED GEISINGER INDICATOR



A THE GEISINGER INDICATOR

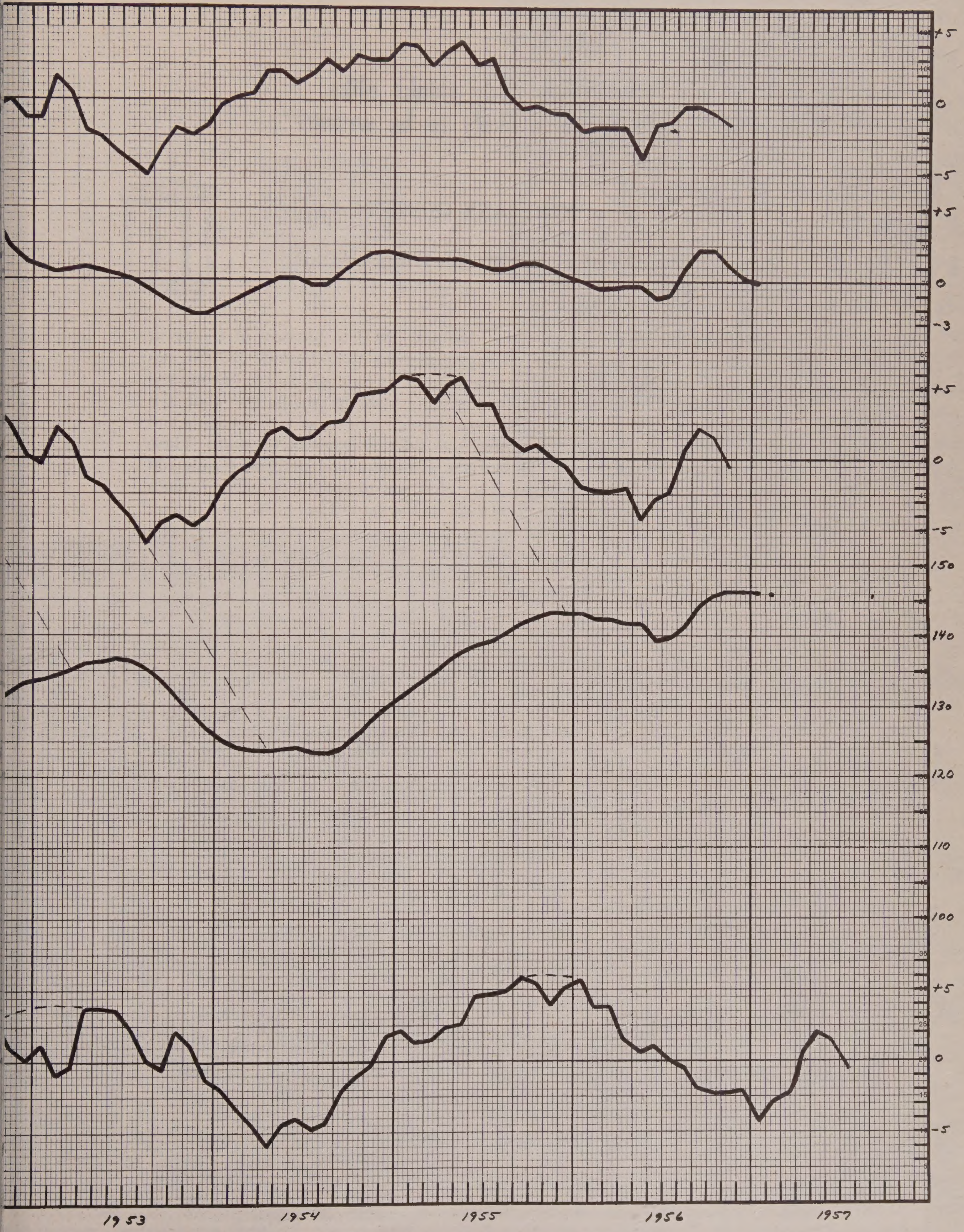
B THE FIRST DIFFERENCE INDICATOR

C THE MODIFIED GEISINGER INDICATOR (A+B)

D THE FEDERAL RESERVE BOARD INDEX OF INDUSTRIAL PRODUCTION SMOOTHED

E THE MODIFIED GEISINGER INDICATOR ADVANCED

OF INDUSTRIAL PRODUCTION



Turn to page 109 for the forecast.

Mr. H. A. Musham
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